

REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1 and 4-11 are pending in the present application. Claims 1, 4, and 5 have been amended without adding new matter and Claim 3 has been canceled without prejudice.

In the outstanding Office Action, an improper acknowledgment of a non-existent priority claim was made; the drawings were objected to; Claims 1, 3, 4, and 11 were rejected under 35 U.S.C. § 103(a) as unpatentable over Takigawa et al. (U.S. Patent No. 4,430,570, herein "Takigawa") in view of Veneklasen et al. (U.S. Patent No. 6,392,333, herein "Veneklasen"); Claims 5-8 were rejected under 35 U.S.C. § 103(a) as unpatentable over Takigawa in view of Veneklasen in further view of Hohn (U.S. Patent No. 4,468,586); and Claims 9-10 were rejected under 35 U.S.C. § 103(a) as unpatentable over Takigawa in view of Veneklasen in further view of Hiraoka et al. (U.S. Patent No. 4,311,941, herein "Hiraoka").

Regarding the priority acknowledgement indicated in the outstanding Office Action, on page 1, item 12, Applicants respectfully submit that no priority claim has been made in this application. Therefore, Applicants respectfully request that a further Office Communication corrects this matter.

Regarding the objection to the drawings, Applicants respectfully submit that Figure 4, submitted with the previously filed amendment, shows a rounded electron emission surface at a tip of an electron emission cathode and that rounded surface is a portion of a sphere. Thus, the claimed surface being spherical is shown in Figure 4. Accordingly, it is respectfully requested this objection be withdrawn.

Claims 1, 3, 4, and 11 were rejected under 35 U.S.C. § 103(a) as unpatentable over Takigawa in view of Veneklasen. That rejection is respectfully traversed.

Independent Claim 1 has been amended to recite the features of Claim 3, which is now canceled.

Briefly recapitulating, independent Claim 1 is directed to an electron gun having an electron emission cathode, a control electrode, and an extractor. The electron emission cathode has an electron emission surface that is spherical and an apex angle of the tip portion of the electron emission cathode is 50-100°. In a non-limiting example, Figure 4 shows the cathode 1, the control electrode 6, the extractor 7, and the electron emission surface of the electron emission cathode 1 being spherical.

Turning to the applied art, Takigawa shows in Figure 1 an electron gun 10 having a cathode 12, an electrode 14, and an anode 20. However, Takigawa does not teach or suggest an apex angle of a tip portion of the cathode being 50-100°. Further, as recognized in the outstanding Office Action at page 3, lines 19-20, “Takigawa fails to teach or fairly suggest the electron emission cathode being located between the control electrode and extractor.” The outstanding Office Action relies on Veneklasen for disclosing that feature. However, Veneklasen does not teach or suggest that an electron emission surface of the electron emission cathode is spherical and an apex angle of a tip portion of the electron emission cathode is 50-100°.

Although the outstanding Office Actions states at page 4, lines 5-6, regarding Claim 3, that Takigawa discloses at column 5, line 8, an apex angle of a tip portion of an electron emission cathode being 50-100°, Applicants respectfully submit that Takigawa specifically states at column 5, lines 6-8, that “the *half* the vertical angle ϕ [θ] of the cathode chip *must* be between 60° and 80°” (emphasis added). However, half the vertical chip angle θ is not the same thing as the apex angle that is claimed.

Accordingly, it is respectfully submitted that Claim 1 and each of the claims depending therefrom patentably distinguish over Takigawa in view of Veneklasen.

Claims 5-8 were rejected under 35 U.S.C. § 103(a) as unpatentable over Takigawa in view of Veneklasen in further view of Hohn. That rejection is respectfully traversed.

Independent Claim 5 has been amended to recite an electron emission surface being “circular flat,” as disclosed for example in the specification at page 12, Table 1.

As recognized in the outstanding Office Action, at page 5, first paragraph, “Takigawa fails to teach or fairly suggest the electron emission cathode having an electron emission surface being flat.” The outstanding Office Action relies on Hohn for disclosing that feature. However, Applicants respectfully submit that neither Takigawa nor Hohn teaches or suggests an electron emission surface being circular flat as recited by amended Claim 5.

Accordingly, it is respectfully submitted that independent Claim 5 and each of the claims depending therefrom patentably distinguish over Takigawa in view of Veneklasen in further view of Hohn.

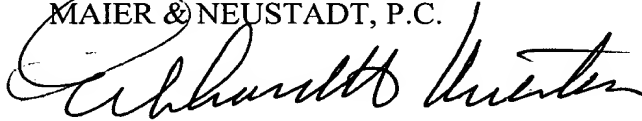
Claims 9 and 10 were rejected under 35 U.S.C. § 103(a) as unpatentable over Takigawa in view of Veneklasen in further view of Hiraoka. That rejection is respectfully traversed.

The outstanding Office Action relies on Hiraoka for disclosing heaters including carbon. However, Hiraoka does not cure the deficiencies of Takigawa and Veneklasen discussed above. In addition, Claims 9 and 10 depend from independent Claim 1, which is believed to be allowable as noted above. Accordingly, it is respectfully submitted that dependent Claims 9 and 10 are also allowable.

Consequently, in light of the above discussion and in view of the present amendment, the present application is believed to be in condition for allowance and an early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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